FORM PTO-1390 (Modified) (REV 10-95) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

ATTORNEY'S DOCKET NUMBER: 1707

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR): 09/890199

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/DE 00/04019	NOVEMBER 11, 2000	NOVEMBER 29, 2001

TITLE OF INVENTION

SPUR-TOOTHED WHEEL FOR A WORM GEAR AND A FORM FOR PRODUCING SUCH A SPUR-TOOTHED GEAR

APPLICANT(S) FOR DO/EO/US

Walter HAUSSECKER, Rudolf STRAUB, Frank MOSKOB, Werner ERNST, Rudolf AUER, Michael BAUSER, Hans MATTES

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☐ This is an express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☐ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371 (c) (2))
   a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☒ has been transmitted by the International Bureau.
   c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☐ A copy of the International Search Report (PCT/ISA/210).
8. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
   a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☐ have been transmitted by the International Bureau.
   c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
   d. ☐ have not been made and will not be made.
9. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
10. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).
11. ☐ A copy of the International Preliminary Examination Report (PCT/IPEA/409).
12. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).

Items 13 to 18 below concern document(s) or information included:

13. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
14. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15. ☒ A **FIRST** preliminary amendment.
    A **SECOND** or **SUBSEQUENT** preliminary amendment.
16. ☐ A substitute specification.
17. ☐ A change of power of attorney and/or address letter.
18. ☒ Certificate of Mailing by Express Mail
19. ☐ Other items or information:

EL 364016655 US

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR	INTERNATIONAL APPLICATION NO.	ATTORNEY'S DOCKET NUMBER
09/890199	PCT/DE 00/04019	1707

20. The following fees are submitted:.

BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :

		CALCULATIONS PTO USE ONLY
☐	Search Report has been prepared by the EPO or JPO	**$930.00**
☐	International preliminary examination fee paid to USPTO (37 CFR 1.482)	**$720.00**
☐	No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2))	**$790.00**
☒	Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2) paid to USPTO	**$1,070.00**
☐	International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4)	**$98.00**

ENTER APPROPRIATE BASIC FEE AMOUNT =	**$1,000.00**	
Surcharge of **$130.00** for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (e)).	**$0.00**	

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	11 - 20 =	0	x $18.00	**$0.00**	
Independent claims	1 - 3 =	0	x $80.00	**$0.00**	
Multiple Dependent Claims **(check if applicable)**.			☐	**$0.00**	
TOTAL OF ABOVE CALCULATIONS =				**$1,000.00**	
Reduction of 1/2 for filing by small entity, if applicable. Verified Small Entity Statement must also be filed (Note 37 CFR 1.9, 1.27, 1.28) **(check if applicable).**			☐	**$0.00**	
SUBTOTAL =				**$1,000.00**	
Processing fee of **$130.00** for furnishing the English translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (f)).			+	**$0.00**	
TOTAL NATIONAL FEE =				**$1,000.00**	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) **(check if applicable).**			☐	**$0.00**	
TOTAL FEES ENCLOSED =				**$1,000.00**	
				Amount to be: refunded	$
				charged	$

☐ A check in the amount of to cover the above fees is enclosed.

☒ Please charge my Deposit Account No. **19-4675** in the amount of **$1,000.00** to cover the above fees.
A duplicate copy of this sheet is enclosed.

☒ The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. **19-4675** A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

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27233
REGISTRATION NUMBER

JULY 26, 2001
DATE

UNITED STATES PATENT AND TRADEMARK OFFICE

Examiner: Group: Attorney Docket # 1707

Applicant(s) : HAUSSECKER, W.,E T AL

Serial No. :

Filed : Simultaneously

For : SPUR-TOOTHED WHEEL FOR A WORM GEAR AND A FORM FOR PRODUCING SUCH A SPUR-TOOTHED WHEEL

SIMULTANEOUS AMENDMENT

July 26, 2001

Honorable Commissioner of Patents and Trademarks
Washington, D.C. 20231

S I R S:

Simultaneously with filing of the above identified application please amend the same as follows:

In the Claims:

Cancel all claims without prejudice.

Substitute the claims attached hereto.

REMARKS:

This Amendment is submitted simultaneously with filing of the above identified application.

With the present Amendment applicant has amended the claims so as to eliminate their multiple dependency.

Consideration and allowance of the present application is most respectfully requested.

Respectfully submitted,

Michael J. Striker
Attorney for Applicant(s)
Reg. No. 27233

Claims

1. Spur-toothed wheel for a worm gear having a first wheel disk (12) which carries teeth on a face that is cylindrical or designed in the shape of a truncated cone, characterized in that it has at least one second wheel disk (13, 14) which touches the first wheel disk (12) at a boundary surface (15) and which carries teeth on a face designed in the shape of a truncated cone, that the teeth of the two wheel disks continuously mesh into each other at the boundary surface (15), and that at least one of the two faces converges toward the boundary surface (15).

2. Spur-toothed wheel according to Claim 1, characterized in that the first wheel disk (12) is cylindrical.

3. Spur-toothed wheel according to Claim 1, characterized in that it has two second wheel disks (13, 14) on both sides of the first wheel disk (12).

4. Spur-toothed wheel according to [one of the preceding claims] Claim 1, characterized in that it is designed as a single piece.

5. Spur-toothed wheel according to [one of the preceding claims] Claim 1, characterized in that it is produced using an injection moulding procedure.

6. Form for producing a toothed wheel according to [one of the preceding claims] Claim 1, characterized in that it includes a tooth system insert (20) for the simultaneous shaping of the teeth of all wheel disks (12, 13, 14).

7. Form according to Claim 6, characterized in that the tooth system insert comprises multiple axial sections (21, 22, 26), each of which is complementary to a wheel disk.

8. Form according to Claim 6, characterized in that the tooth system insert extends as a single piece across the entire axial width of the teeth of all wheel disks.

9. Form according to Claim 8, characterized in that each tooth notch (24) of the tooth system insert (20, 20') is produced using a number of processing steps corresponding to the number of wheel disks (12, 13, 14) using an abrading tool (23), whereby the tooth system insert (20, 20') is tilted downward relative to the tool (23) between two processing steps.

10. Form according to [one of the Claims 6 through 9] Claim 6 for producing a toothed wheel according to Claim 2, characterized in that the tooth system insert (20) is designed as a single piece in the circumferential direction for removing the spur-toothed wheel from the mould in the axial direction.

11. Form according to [one of the Claims 6 through 9] Claim 6, characterized in that the tooth system insert (20') is divided into multiple segments (27) in the circumferential direction for removal from the mould in the radial direction.

Claims

1. Spur-toothed wheel for a worm gear having a first wheel disk (12) which carries teeth on a face that is cylindrical or designed in the shape of a truncated cone, characterized in that it has at least one second wheel disk (13, 14) which touches the first wheel disk (12) at a boundary surface (15) and which carries teeth on a face designed in the shape of a truncated cone, that the teeth of the two wheel disks continuously mesh into each other at the boundary surface (15), and that at least one of the two faces converges toward the boundary surface (15).

2. Spur-toothed wheel according to Claim 1, characterized in that the first wheel disk (12) is cylindrical.

3. Spur-toothed wheel according to Claim 1, characterized in that it has two second wheel disks (13, 14) on both sides of the first wheel disk (12).

4. Spur-toothed wheel according to Claim 1, characterized in that it is designed as a single piece.

5. Spur-toothed wheel according to Claim 1, characterized in that it is produced using an injection moulding procedure.

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11. Form according to Claim 6, characterized in that the tooth system insert (20') is divided into multiple segments (27) in the circumferential direction for removal from the mould in the radial direction.

(12) NACH DEM VERTRAG ÜBER DIE INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES PATENTWESENS (PCT) VERÖFFENTLICHTE INTERNATIONALE ANMELDUNG

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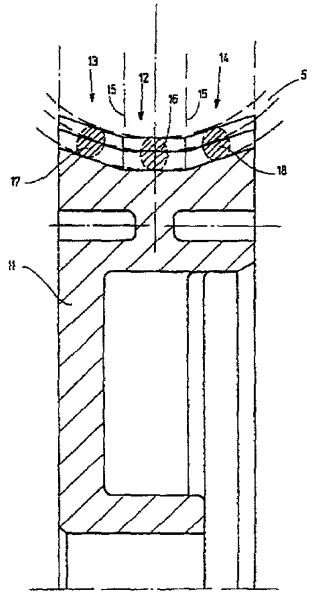
[Fortsetzung auf der nächsten Seite]

(54) Title: SPUR PINION FOR A WORM GEAR AND AN EMBODIMENT FOR PRODUCING SUCH A WORM GEAR

(54) Bezeichnung: STIRNRAD FÜR EIN SCHNECKENGETRIEBE UND EINE FORM ZUR HERSTELLUNG EINES SOLCHEN STIRNRADS



(57) Abstract: The invention relates to a spur pinion (11) for a worm gear. The inventive pinion is provided with at least two wheel discs (12, 13, 14) having a cylindrical or truncated front face. The wheel discs adjoin each other at a boundary surface (15). The teeth of the two adjacent wheel discs verge into each other in a continuous manner on said boundary surface. At least one of the front faces converges in the direction towards the boundary surface in such a way that the teeth of all the wheel discs can mesh with the same worm. The invention also relates to an embodiment for producing the inventive spur pinion.

[Fortsetzung auf der nächsten Seite]

WO 01/40679 A2

SPUR-TOOTHED WHEEL FOR A WORM GEAR AND A FORM FOR PRODUCING SUCH A SPUR-TOOTHED WHEEL

The present invention concerns a spur-toothed wheel for a worm gear and a form for producing such a spur-toothed wheel by way of injection moulding, for example.

Toothed wheels with helical gearing or globoidal or semi-globoidal toothed wheels are traditionally used as spur-toothed wheels for worm gears. While the tips of all teeth lie on a cylindrical surface in a simple toothed wheel having helical gearing, this surface in a globoidal toothed wheel has the shape of a concave circular arc in the axial profile. In a semi-globoidal toothed wheel, the cross section consists of a circular arc on which a straight line intercept touches it tangentially at the point closest to its axis.

Globoidal or semi-globoidal toothed wheels are used in applications in which the tooth system must have a high load-carrying capacity, because a globoidal tooth system can support a worm having a diameter adapted to the circular arc of the globoid practically along the entire width of the tooth system, and not only in a center section, as is the case with a simple helical gearing. The production of globoidal wheels is much more laborious than that of simple helically-toothed wheels, however, because, in order to work a single globoidal tooth out of a toothed wheel blank or the blank of a form, the position of the tool must be continuously adapted according to a complicated scheme as the processing progresses.

Advantages of the Invention

As a result of the present invention, a spur-toothed wheel for a worm gear is created, on the one hand, which has a greatly improved load-carrying capacity as

compared to a traditional toothed wheel having helical gearing and a cylindrical circumferential surface, the production of which is markedly simpler and less expensive than that of a globoidal wheel, however.

This is achieved in that, with a spur-toothed wheel for a worm gear which, in traditional fashion, has a first wheel disk having teeth on a cylindrical or conical face, at least one second wheel disk is added that touches the first wheel disk at a boundary surface and which carries teeth on a face designed in the shape of a truncated cone, whereby the teeth of the two wheel disks continuously mesh into each other at the boundary surface, and at least one of the two faces converges toward the boundary surface. In other words, one can conceive of designing the spur-toothed wheel according to the invention out of two wheel disks, of which at least one is designed in the shape of a truncated cone and the other is cylindrical or designed in the shape of a truncated cone, whereby at least one of the faces designed in the shape of a truncated cone is tapered toward the boundary surface. The constant meshing of the teeth of the two wheel disks is provided so that both wheel disks jointly mesh with the same worm and can thereby carry a load.

Preferably, two second wheel disks are provided on both sides of the first wheel disk, so that the tooth system can carry a load at three places altogether.

It is possible to produce each of the wheel disks individually and provide them with teeth and then combine the completed toothed wheel disks to form the spur-toothed wheel according to the invention. In this fashion, the spur-toothed wheel according to the invention can be produced out of metal using an abrading machining process, for example.

It is preferred that the spur-toothed wheel be designed as a single piece. Such a spur-toothed wheel can be produced inexpensively using a moulding process such as injection moulding, out of a hard plastic, for example.

Object of the invention is therefore also a form for producing a spur-toothed wheel of the type described above which includes a tooth system insert for the simultaneous shaping of the teeth of all wheel disks.

Such a tooth system insert can comprise multiple formed wheels, each of which is complementary to one wheel disk. It is also possible in advantageous fashion, however, that the tooth system insert extend as a single piece across the entire axial width of the teeth of all wheel disks. Such a form is particularly easy to produce in that a number of processing steps corresponding to the number of wheel disks is carried out for each tooth notch using an abrading tool, whereby the tooth system insert has been tilted downward relative to the tool in the plane of the tooth notch between two processing steps.

The tooth system insert can be designed as a single piece in the circumferential direction. This makes it possible for a finished spur-toothed wheel to be removed from the mould using a helical motion. Such a form is suited to producing toothed wheels having two wheel disks, one of which is cylindrical.

As an alternative, the tooth system insert can be divided into multiple segments in the circumferential direction in order to make it possible to remove a finished toothed wheel from the mould by removing the segments in the radial direction.

Further features and advantages of the invention result from the following description of design examples with reference to the figures.

Figures

Figure 1 shows, highly diagrammed, two worm gears, one of which has a globoidal spur-toothed wheel, and the other of which has a helically-toothed spur-toothed wheel;

Figures 2 and 3 show an axial view of two variants of the spur-toothed wheel according to the invention;

Figure 4 shows two stages of the production of a tooth system insert;

Figure 5 shows the cross section of a tooth system insert according to a first design; and

Figure 6 shows a tooth system insert according to a second design, in top view and as a sectional drawing.

Description of the Design Examples

In order to better illustrate the special nature of the present invention, Figure 1 first shows two traditional worm gears, a gear 1 having a globoidal spur-toothed wheel 2 and a gear 2 having a simple, helically-toothed spur-toothed wheel 4, both of them in mesh with a worm 5. In the idealized illustration of Figure 1, the worm 5 can be seen in both cases in a top view along its axis, and the spur-toothed wheels 3, 4 are shown as a sectional detail view.

In a helically-toothed spur-toothed wheel 4, contact between the spur-toothed wheel and the worm 5 is possible only on a narrow area 7 lying approximately in center on the tooth 6. The surface on which the spur-toothed wheel and the worm touch each other at a given point in time travels up and down within the contact area 7 in the course of the rotation of the gear on the tooth 6. In an idealized gear having absolutely stiff wheels, this surface would be punctiform, in practical application, its expansion depends on the flexibility of the material of the wheels and its extent of wear. The surface load of the contact area 7 is relatively great here, and it can lead to a rapid wearing of the spur-toothed wheel 4,

particularly if it is manufactured out of an inexpensive yet moderately resistant material such as a plastic.

In a globoidal spur-toothed wheel 3, in contrast, contact with the worm 5 at all times is not possible at one point, but rather along a line that travels over the entire contact area 8 shown in the illustration as a shaded area in the course of the rotation of the gear. The contact area is practically identical with the surface of a tooth of the spur-toothed wheel. The load and, therefore, the wear, is distributed evenly across the entire surface of the tooth.

Figure 2 shows a first design example of a spur-toothed wheel 11 according to the invention in an axial half-sectional view. The shape of the associated worm 5 is indicated by dashed lines. The spur-toothed wheel 11 can be understood as comprising three wheel disks 12, 13, 14. The wheel disk 12 has a cylindrical circumferential surface, those of the wheel disks 13, 14 are designed in the shape of a truncated cone, whereby each smaller base area of the truncated cone forms a boundary surface with the wheel disk 12. All three circumferential surfaces have a helical gearing, whereby each of the teeth of the individual wheel disks continously mesh into each other at the boundary surfaces 15. The groove angles of the circumferential surfaces designed in the shape of a truncated cone are specified as a function of the diameter of the worm 5 in such a way that each of the teeth of all three wheel disks touch those of the worm in contact areas 16, 17, 18. The contact surface is therefore increased three-fold as compared with that of the worm gear 2.

If an even greater contact area is required, the number of wheel disks and, therefore, the contact areas, can also be made larger than three.

Figure 3 shows a simplified variant of the spur-toothed wheel from Figure 2. The wheel disk 13 designed in the shape of a truncated cone is eliminated in this

variant; instead, the cylindrical wheel disk 12 is widened. This variant is advantageous in production, as will become clear later.

Basically, the spur-toothed wheels shown in Figures 2 and 3 can be produced directly as globoidal wheels via abrading processing of a blank. A particular advantage compared to a globoidal wheel, however, is that the wheels according to the invention are suited for production via moulding and can therefore be produced much less expensively. In order to produce the teeth via moulding, a tooth system insert is required which can form a permanent or removable component of a form, of an injection moulding form, for instance. Figure 4 shows a diagram of the production of such a tooth system insert 20. A metal ring is used as the form for the production of the insert 20, the inner circumferential surface of which has multiple, sequential sections in the axial direction, each corresponding to the wheel disks of the toothed wheel to be produced. The ring 20 shown in Figure 4 has two such sections 21, 22, which correspond to the circular disks 12 and 14, respectively, of the spur-toothed wheel from Figure 3. In the production section illustrated in Part a of Figure 4, tooth notches 24 are created in the first section 21 using the electroerosion technique by way of a wire 23, each of which corresponds to teeth of the circular disk 12 of the toothed wheel to be produced. After the section 21 has been provided with tooth notches 24 all the way around in this fashion, the ring 20 is tilted downward relative to the wire 23, so that corresponding tooth notches can also be formed in the adjacent section 21 in extension of each of the tooth notches 24 of the section 21. This stage is illustrated in Part b of Figure 4. Every time a tooth notch 24 is completed on the section 21, the ring 20 can also be tilted, of course, in order to create the corresponding notch in the section 22. In this process, the orientation of the tilting axis and tilting angle is selected as a function of the dimensions of a worm in such a way that the teeth of both sections formed later by the tooth notches can mesh with the worm and carry a load.

Figure 5 shows the finished tooth system insert 20 installed in a shell 25 of an injection moulding form. The tooth system insert 20 can be permanently installed in the shell 25, since, in order to remove a toothed wheel produced therein from the mould, it suffices to rotate this around the axis 26 in order to cause the toothed wheel to detach from the form in an upward direction and come free.

If the tooth system insert for the production of a toothed wheel of the form shown in Figure 2 has two sections designed in the shape of a truncated cone as the section 22 from Figure 4, this simple method of removal from the mould is no longer possible.

Figure 6 shows such a tooth system insert 20' in a top view and as a sectional drawing. As one can easily imagine based on the sectional drawing, the second section 26 designed in the shape of a truncated cone prevents a finished toothed wheel from being screwed out of the insert in the axial direction. For this reason, the tooth system insert 20' is divided into multiple sectors 27 in the circumferential direction. The number of sectors can be greater than the four sectors shown in the figure; its number is specified as appropriate in such a way that a simple removal from the mould is possible by moving the sectors 27 off of the finished toothed wheel in the radial direction.

Claims

1. Spur-toothed wheel for a worm gear having a first wheel disk (12) which carries teeth on a face that is cylindrical or designed in the shape of a truncated cone, characterized in that it has at least one second wheel disk (13, 14) which touches the first wheel disk (12) at a boundary surface (15) and which carries teeth on a face designed in the shape of a truncated cone, that the teeth of the two wheel disks continuously mesh into each other at the boundary surface (15), and that at least one of the two faces converges toward the boundary surface (15).

2. Spur-toothed wheel according to Claim 1, characterized in that the first wheel disk (12) is cylindrical.

3. Spur-toothed wheel according to Claim 1, characterized in that it has two second wheel disks (13, 14) on both sides of the first wheel disk (12).

4. Spur-toothed wheel according to one of the preceding claims, characterized in that it is designed as a single piece.

5. Spur-toothed wheel according to one of the preceding claims, characterized in that it is produced using an injection moulding procedure.

6. Form for producing a toothed wheel according to one of the preceding claims, characterized in that it includes a tooth system insert (20) for the simultaneous shaping of the teeth of all wheel disks (12, 13, 14).

7. Form according to Claim 6, characterized in that the tooth system insert comprises multiple axial sections (21, 22, 26), each of which is complementary to a wheel disk.

8. Form according to Claim 6, characterized in that the tooth system insert extends as a single piece across the entire axial width of the teeth of all wheel disks.

9. Form according to Claim 8, characterized in that each tooth notch (24) of the tooth system insert (20, 20') is produced using a number of processing steps corresponding to the number of wheel disks (12, 13, 14) using an abrading tool (23), whereby the tooth system insert (20, 20') is tilted downward relative to the tool (23) between two processing steps.

10. Form according to one of the Claims 6 through 9 for producing a toothed wheel according to Claim 2, characterized in that the tooth system insert (20) is designed as a single piece in the circumferential direction for removing the spur-toothed wheel from the mould in the axial direction.

11. Form according to one of the Claims 6 through 9, characterized in that the tooth system insert (20') is divided into multiple segments (27) in the circumferential direction for removal from the mould in the radial direction.

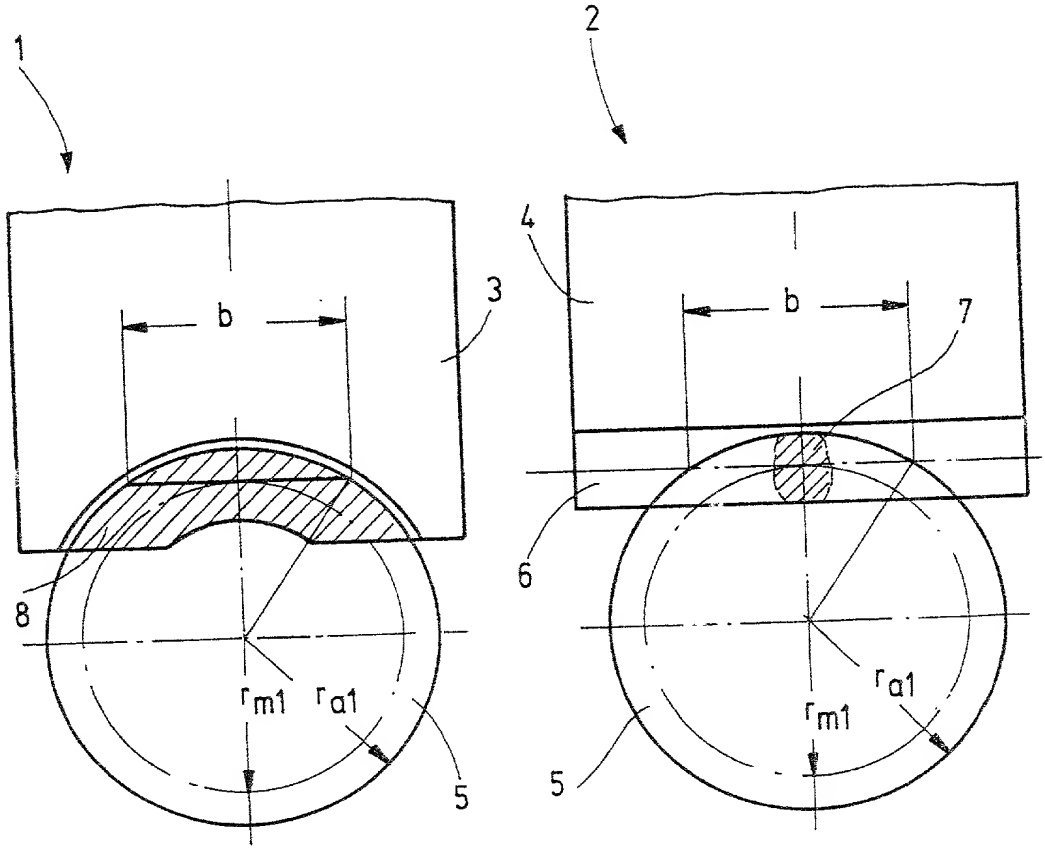


Fig.1

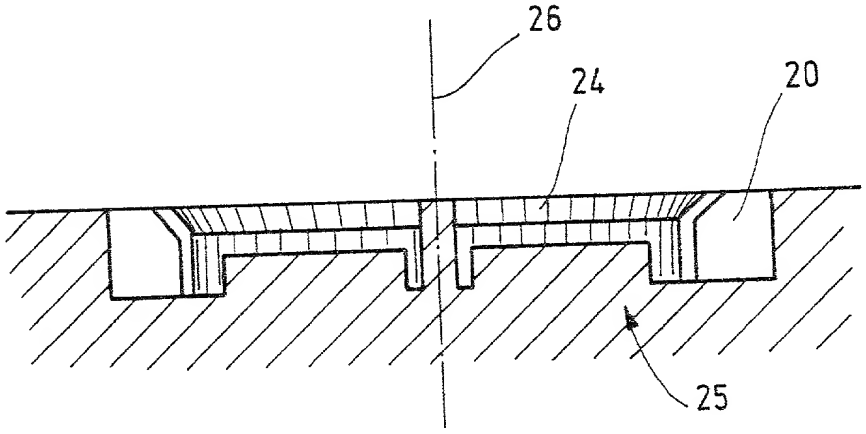


Fig.5

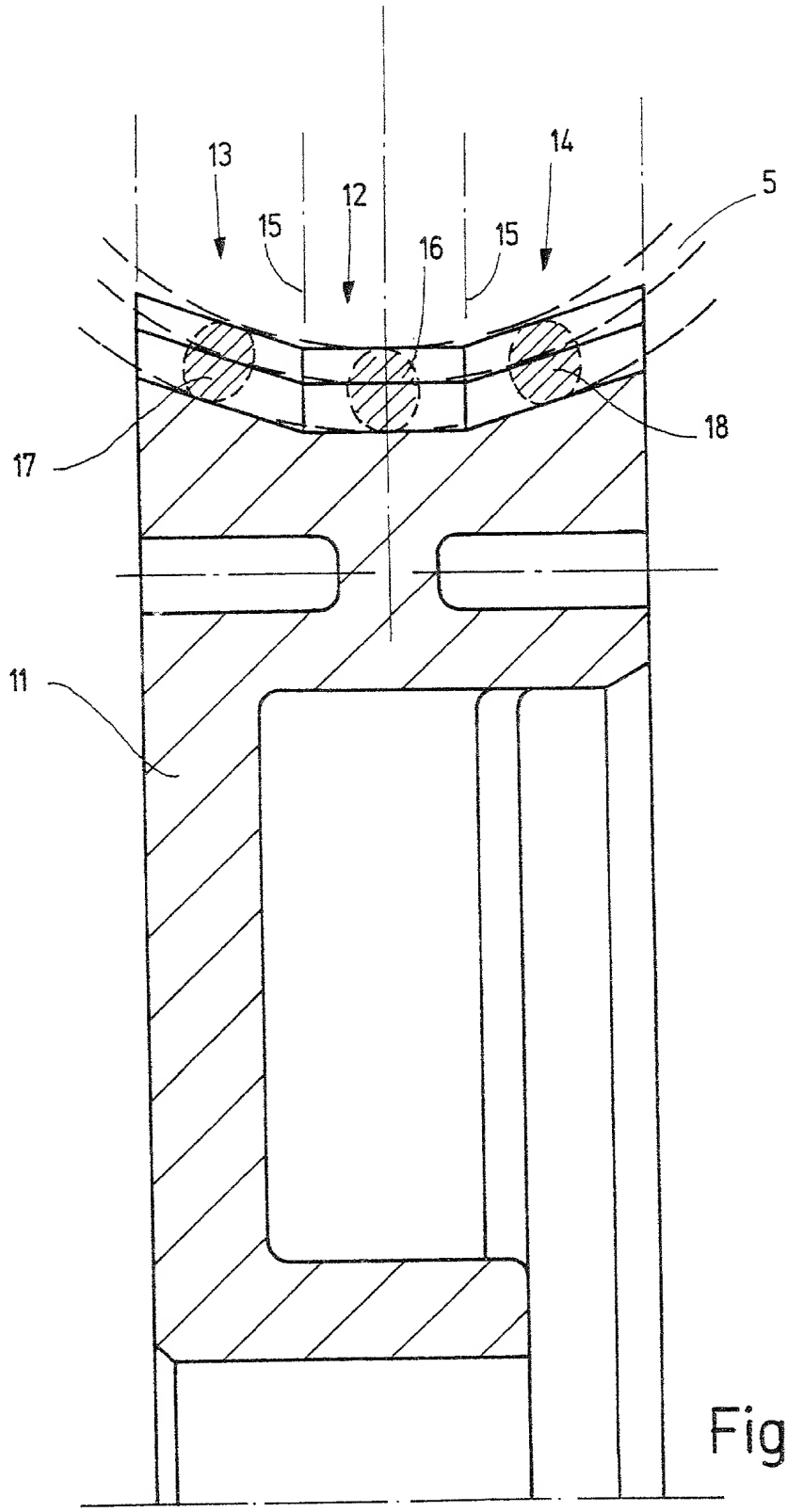


Fig. 2

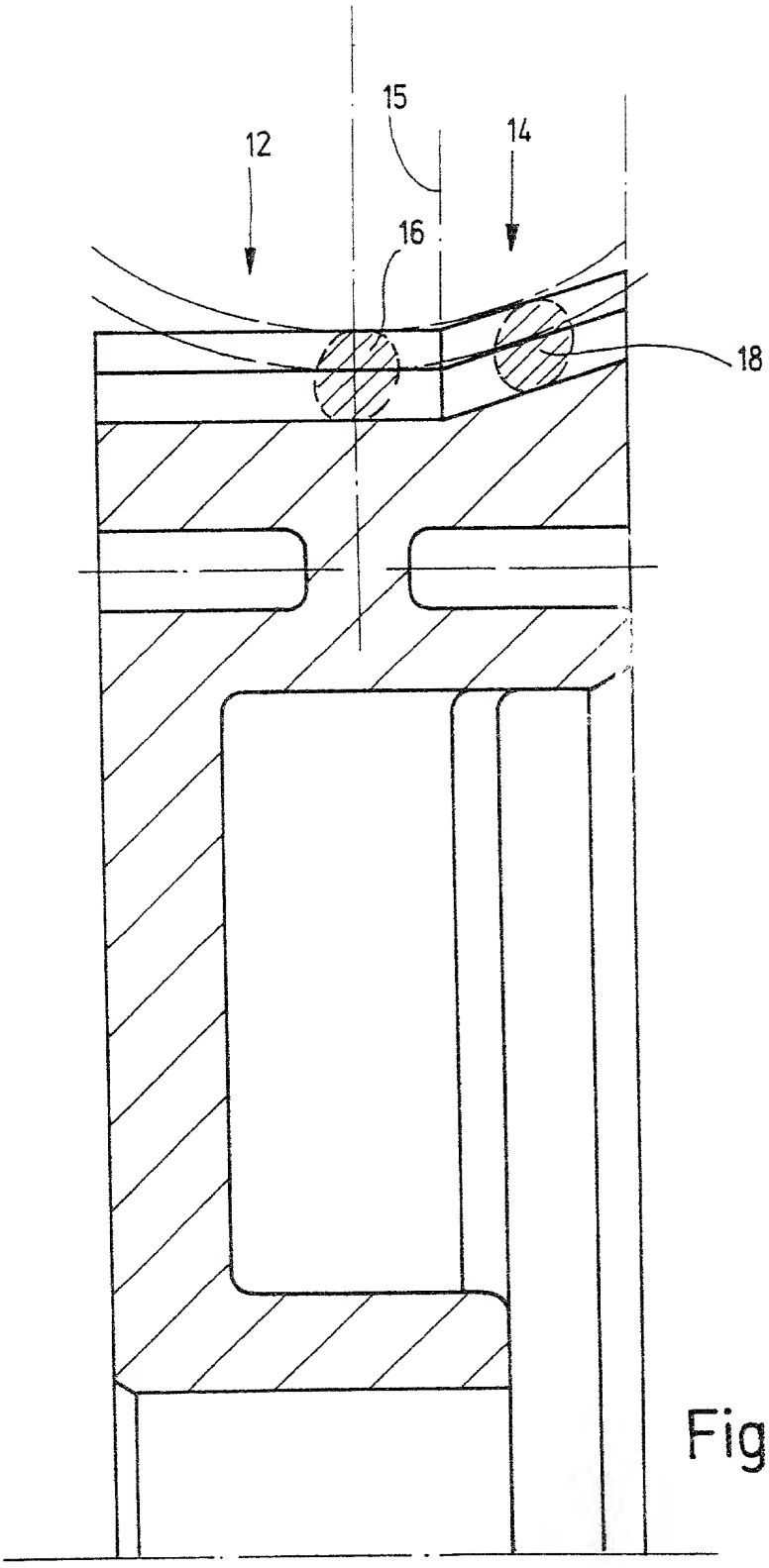
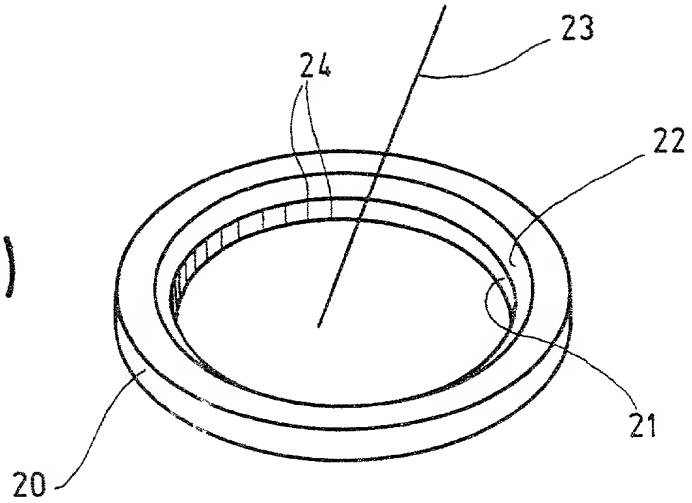


Fig.3

Fig.4

a)



b)

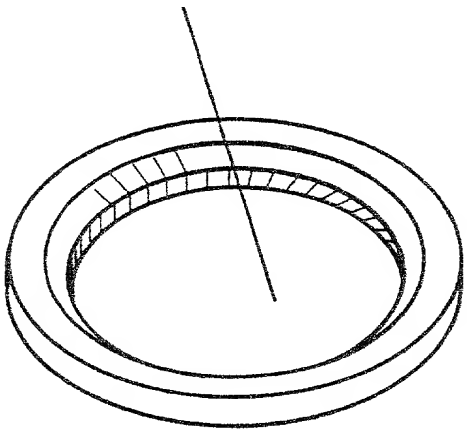
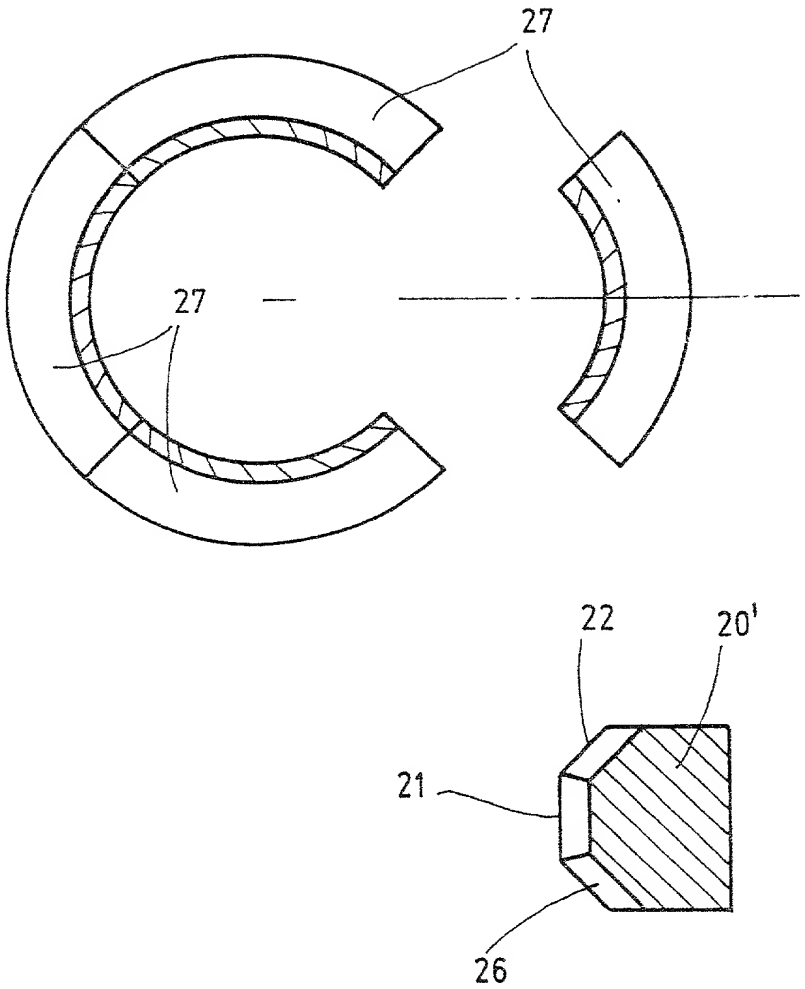


Fig. 6



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DECLARATION AND POWER OF ATTORNEY FOR NATIONAL STAGE OF PCT PATENT APPLICATION

As a below-named inventor, I hereby declare that:

Walter HAUSSECKER
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Werner ERNST
Rudolf AUER
Michael BAUSER
Hans MATTES

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled **SPUR-TOOTHED WHEEL FOR A WORM GEAR AND A FORM FOR PRODUCING SUCH A SPUR-TOOTHED WHEEL** the specification of which was filed as PCT International Application number PCT/DE 00/04019 on November 11, 2000.

I hereby state that I believe the named inventor or inventors in this Declaration to be the original and first inventor or inventors of the subject matter which is claimed and for which a patent is sought.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose all information which is material to the patentability of this application in accordance with Title 37, Code of Federal Regulations, Section 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119(a)-(d) or Section 365 (b) of any foreign application(s) for patent or inventor's certificate, or Section 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate or PCT International application having a filing date before that of the application on which priority is claimed.

Prior foreign application(s):			Priority claimed:	
199 57 440.5	GERMANY	NOVEMBER 29, 1999	X	
(Number)	(Country)	(Date filed)	Yes	No
(Number)	(Country)	(Date filed)	Yes	No

As a named inventor, I hereby appoint the following attorney to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with

the knowledge that wilful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such wilful false statement may jeopardize the validity of the application or any patent issued thereon.

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